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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,413	07/30/2001	John Robert Siddle	1-15467	2002

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT

PAPER NUMBER


1753

4

DATE MAILED: 10/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-4

 Office Action Summary	Application No. 09/890,413	Applicant(s) SIDDLE, JOHN ROBERT	
	Examiner Steven H VerSteeg	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 21-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-18 and 20, drawn to a process for the production of a coated substrate.

Group II, claim(s) 19 and 24, drawn to a low pressure process for the deposition of a reflective metal layer on a substrate.

Group III, claim(s) 21, 22, and 25, drawn to coated glass.

Group IV, claim(s) 23, drawn to use of a gaseous oxygen scavenger.

2. The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the independent claims do not all contain the special technical feature of the gaseous oxygen scavenger not being hydrogen.

3. During a telephone conversation between Mark Hixon and Andrew Piziala on September 10, 2002 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-18 and 20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19 and 21-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Claim Objections

4. Claims 1-18 and 20 are objected to because of the following informalities:

“characterized” is misspelled in claim 1, line 4 and claim 2, line 2; “on to” should be “onto” in claim 1, lines 2-3; “the” needs to be inserted before “production” in claim 18, line 1. Claims 2-18 and 20 depend from claim 1 and contain all of the limitations of claim 1. Therefore, claims 2-18 and 20 are objected to for the same reasons as claim 1. Appropriate correction is required.

5. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 has the requirement that the oxygen scavenger is not hydrogen. Claim 2 requires the oxygen scavenger to be “other than hydrogen”. Therefore, claim 2 provides no additional limitations.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 14 recites the limitation "the sheet resistance" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 15 recites the limitation "the sheet resistance" in line 3. There is insufficient antecedent basis for this limitation in the claim.

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10. Claim 16 depends from claim 15 and contains all of the limitations of claim 15.

Therefore, claim 16 is rejected for the same reasons as claim 15.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-13, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,837,361 to Glaser et al. (Glaser) in view of US 6,010,614 to Keskar et al. (Keskar).

13. For claim 1, Applicant requires a process for the production of a coated substrate comprising depositing a reflective metal layer on a substrate by a low pressure deposition process performed in a coating atmosphere. The coating atmosphere contains a gaseous oxygen scavenger that is not hydrogen. The reflective metal layer is deposited as a layer in a multilayer coating which also contains a bismuth oxide layer. For claim 2, Applicant requires the oxygen scavenger to not contain hydrogen.

14. For claim 11, Applicant requires the reflective metal layer to be silver. For claim 17, Applicant requires the deposition process to be sputtering.

15. Glaser discloses a multilayer stack produced by sputtering comprising bismuth oxide with silver deposited thereon over a glass substrate (Example Embodiment 1). Glaser utilizes hydrogen in the atmosphere.

16. Glaser does not disclose the use of an oxygen scavenger gas that does not contain hydrogen.

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17. Keskar discloses that hydrogen and methane are interchangeable oxygen scavenger gases (col. 2, l. 33-39).

18. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Glaser to utilize methane rather than hydrogen because of the knowledge that hydrogen and methane are interchangeable oxygen scavenger gases that produce equivalent results.

19. For claim 3, Applicant requires the gas to be capable of combining with more than one oxygen atom. As an example of such a gas, Applicant has utilized methane in their specification. Therefore, when Glaser is modified by Keskar and uses methane, the limitation of claim 3 is met.

20. For claim 4, Applicant requires the oxygen scavenger to be a hydrocarbon. For claim 5, Applicant requires the hydrocarbon to be a C₁ to C₄ hydrocarbon. For claim 6, Applicant requires the hydrocarbon to be methane. As noted above, it would have been obvious to utilize methane rather than hydrogen in Glaser.

21. For claim 7, Applicant requires sufficient scavenger to alleviate oxidation and/or degradation of the reflective metal layer. The silver layer is not oxidized in Glaser (col. 6, l. 4-13). Therefore, sufficient scavenger must be added.

22. For claim 8, Applicant requires the amount of scavenger to be in an amount that exceeds 15 mol% of the amount of oxygen. For claim 9, Applicant requires the amount of scavenger to be in an amount that exceeds 30 mol% of the amount of oxygen. For claim 10, Applicant requires the amount of scavenger to be in an amount that exceeds 50 mol% of the amount of oxygen. Glaser sputters in an atmosphere of argon with 5% oxygen scavenging gas (Example

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Embodiment 1). Therefore, Glaser uses the oxygen scavenger in an amount of more than 50 mol% of the amount of oxygen.

23. For claim 12, Applicant requires the reflective metal layer to have a thickness of 5-30 nm. For claim 13, Applicant requires the thickness to be 7-18 nm. Glaser discloses that the thickness of the silver layer is 12 nm (col. 5, l. 48-54).

24. For claim 18, Applicant requires depositing a metal oxide antireflective layer before depositing the reflective metal layer. As shown in Example Embodiment 1, Glaser discloses depositing a metal oxide layer below the silver layer.

25. For claim 20, Applicant requires the substrate to be curved. Glaser discloses that the coated substrates are to be used as windows for automobiles (col. 1, l. 15-21), and car windows are curved.

26. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,837,361 to Glaser et al. (Glaser) in view of US 6,010,614 to Keskar et al. (Keskar) as applied to claim 1 above, and further in view of US 6,398,925 B1 to Arbab et al. (Arbab).

27. For claim 14, Applicant requires the sheet resistance to be below 12 Ω /square. For claim 15, Applicant requires the resistance to be below 12 Ω /square with a measurable amount of oxygen. For claim 16, Applicant requires the resistance to be below 8 Ω /square.

28. Glaser in view of Keskar is described above but does not disclose the sheet resistance. Glaser does, however, indicate that the emissivity is low in the resulting product (Example Embodiment 1) such as 0.003.

29. Arbab discloses that low emissivity in glass substrates coated with silver over a metal oxide layer have sheet resistances that are well below 8 Ω /square when the emissivity is below

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0.065 (Table 2). Because Glaser has emissivity below 0.065, it is obvious that the sheet resistance would be below $8 \Omega/\text{square}$.


Conclusion

In the event that papers are missing from this communication, please contact the Customer Service Center for Technology Center 1700 at (703) 306-5665.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
October 10, 2002